



## International Acceptance Of SI Units

In the last SCOR Executive Meeting in Zurich [October 1987, (SCOR Proceedings Vol. 23)], it was reported that the Joint Panel on Oceanographic Table and Standards (of SCOR) urged the sponsoring agencies to press for the use of SI units (Unesco Technical Papers in Marine Science, No. 45) in Oceanography. After acceptance of the recommendation concerning the use of SI, many oceanographers still persist in using old units, rather than SI units. The Joint Panel suggested that the following statement by SCOR and the other sponsoring agencies be published by various scientific journals in the field of marine science.

"In order to try to harmonize the vocabulary employed in oceanography to the one in use at the international level, the International Association for the Physical Sciences of the Ocean (IAPSO) decided to constitute a Working Group whose mission was to prepare and facilitate the introduction in oceanography of the International System of Units (SI). The recommendations of this Working Group have been adopted by the 18th General Assembly of the IAPSO in 1983 and published in July 1985 (Unesco, 1985) to be effective from 1 January 1986.

This publication includes an explanation of the international rules for the implementation of the physical Quantities, Units and Symbols, indicating the main points of the International System of Units, as well as

specific recommendations in the domain of the Physical Sciences of the Ocean. In addition this publication contains a number of tables dedicated to the most used quantities (fundamental quantities of seawater, physical properties of pure and sea water, dynamical oceanography, optical oceanography, marine geophysics, marine geochemistry, chemical oceanography). In each of these tables are given the principal quantities used with their symbol(s), a brief definition if necessary, the corresponding unit in the International System of Units, and its symbol. Finally, two tables give the conversion factors between certain earlier units and the corresponding units in the International System of Units.

We request all oceanographers to take into consideration the use of the SI in their work and to express the quantities they use with the corresponding units of the SI, and we urge the editors to ensure that scientific papers submitted to them are in conformity with the decision of the IAPSO."

Professor O'Brien offered to assist with the dissemination of this statement to appropriate journals. In this respect, we wish to report to SCOR that the statement was published in the latest issue No. 50 of the *International Marine Science Newsletter* (IMS), and we hope that this statement will be widely disseminated in oceanographic journals.

## INQUA Commission On Quaternary Shorelines

The INQUA Commission on Quaternary Shorelines wants to inform you about the session: "Impact of a Future Rise in Sea-Level on the European Coastal Lowlands." This session

took place during the European Workshop on Interrelated Bioclimatic and Land Use Changes (October 1987), Noordwijkerhout, The Netherlands.

## CONCLUSIONS AND RECOMMENDATIONS

### PREAMBLE

The European Coastal Lowlands comprise deltas and plains including wetlands and natural areas at low altitudes that include extensive zones of intense economic and agricultural activity, and are the home of dense populations. Around the Southern North Sea basin alone the coastal plains are the home of more than 20 million people. These people live close to present sea level, and are already at risk from inundation as a consequence of coastal erosion and storm surge, and the rise of sea level that has occurred during the past 100 years. Sea level has risen by 10 to 15 cm in the past century as the result of global warming, due to the increase of atmospheric CO<sub>2</sub> and other radiative gases and of other factors, and will continue to rise in the next 100 years by amounts estimated between 0.5 and 3.5 metres. Unless remedial actions are taken now, the social and economic impacts will be profound and widespread. During the session these problems were addressed in 12 papers grouped by geographical areas—the Southern North Sea Basin, the Atlantic seaboard of Europe and the Mediterranean. The following conclusions were agreed:

### CONCLUSIONS

- (1) The unequivocal signal from the session was that ALL the European coastal lowlands and their shorelines were already experiencing damage from erosion, inundation during storm surges, storm waves, subsidence and salt water intrusion as the consequences of sea level rise, increased incidence of storminess and man's activities. Man's economic and social activities are exacerbating the situation and comprise:
    - Sand extraction from beaches and offshore for reclamations and the construction industry.
    - The destruction of natural shoreline defences, such as sand dunes, for the provision of hotel accommodation and amenities for the tourist industry.
    - The interruption and diversion of long-shore sediment transport by groynes, jetties and harbours.
  - The reduction of the sediment load of rivers by water management in drainage basins and the construction of dams and reservoirs, cutting of sediment supply to nourish beaches and deltas
  - The canalisation of rivers for navigational purposes
  - The reclamation of coastal lowlands for agriculture, industrialisation and residential development
  - The utilisation of groundwater for drinking water and irrigation which has led to subsidence, and the penetration of salt water.
- (2) The maximum rise of sea level during the recent geological past did not exceed 2.2 m/100 years, and during the past 4000 years when the rate of rise was considerably less, sedimentation has kept up with and locally exceeded sea level rise. In natural areas, where man's activities are not pre-eminent, such as the Dutch, German and Danish Wadden Sea, sedimentation has kept up with the present rise of sea level of 10-15 cm/100 years. Investigations of the sediments of the coastal lowlands indicate that, given a natural sediment budget, these areas responded and adjusted to a range of rates of sea level change and climatic change in the past.
  - (3) Current data bases are uneven spatially and temporally, and are inadequate for the purposes of prediction. Environmental, social and economic data are required from existing sources and new investigations in compatible and accessible forms. A notable deficiency in the environmental data base is analysed information on the sediment budget of the shorelines of coastal lowlands and adjacent shorelines, waves, tides, the strength and direction of tidal currents and the range of variation of these parameters in time. Geographic information systems should be employed to integrate data collection, analysis, management and display.
  - (4) The risks from sea level rise and the impacts on coastal lowlands can be evaluated by the application of cost-benefit analysis. Land use conflicts are a feature of coastal lowlands and decisions will need to

be made on which activities and functions need protection and which can be lost without cost to the human community. The concept of sacrificial areas is accepted.

### RESEARCH PROPOSALS

- (1) Monitoring the movement of sea level employing the tide gauge data maintained and updated by the Permanent Service for Mean Sea level, I.O.S., Bidston, U.K., to determine the increased rate of sea level rise, and local variations.
- (2) Monitoring the impact of sea level rise, neotectonic movements (earthquakes) and man's economic and social activities on European shorelines and coastal lowlands using satellite imagery analysis.
- (3) Investigations on the coastal dynamics of European shorelines to determine changes in the sediment budget consequent upon sea level rise.
- (4) Investigations on the recent geological history of coastal lowlands and the determination for each lowland of rates of sea level change and the responses in terms of sediment type and distribution, of land forms and of paleogeography. These investigations will serve as an analogue for future sea level changes. Data from Unesco/IGCP projects 61 and 200 on sea level change can be utilised, and enhanced by new data, contributed by the INQUA Shorelines subcommissions and the IGU Coastal Commission.
- (5) The development and application of objective criteria to be applied to land use planning in the coastal lowlands of Europe, and the production of maps showing high, intermediate and low risk zones in relation to the EPA sea level scenarios to AD 2100.
- (6) The updating of the Council of Europe's map of salt marshes of Europe, and an extended inventory to include coastal wetlands and natural areas. The impact of sea level rise, using different sea level scenarios should be undertaken for selected areas of international significance for the world conservation strategy as identified by the U.N. and I.U.C.N., and within the framework of the E.C., UNEP and the INQUA Man and Biosphere programme.

- (7) An investigation into the history of the dunes of the Atlantic sea board of Europe. The investigation will establish the cyclicity of sand blowing and provide a link with climatic changes and sea level changes. A calculation for each dune system of the volume of sand mobilised and stabilised will provide data on the sand volume added to or abstracted from the coastal sand budget, and how much sand will be liberated as sea level rises and the climate changes.

### RECOMMENDATIONS

- (1) Action now
  - Control coastal development, to minimise risks to human life from sea level rise.
  - Control land reclamation, to reduce the growing area of coastal lowlands susceptible to inundation.
  - Control ground water exploitation to reduce subsidence and salt water intrusion.
  - Zone land in lowlands into high, medium and low risk categories. Strategic industries, such as electricity generation, should be located in future away from high risk zoned land.
  - Suspend all dumping/storage of toxic and radio-active wastes in high risk zones in coastal lowlands susceptible to long term inundation sea level rise.
- (2) Action over next 5 years
  - Sponsor research programmes to generate new data from coastal lowlands
  - New and existing environmental data and social and economic data will be integrated in Geographical Information Systems (GIS), developed on PCs to permit interchange of information.
  - Models of sea level change will be tested rigorously against empirical data collected from the coastal lowlands at different spatial scales from the local scale (individual estuary) to the regional scale (southern North Sea Basin, Mediterranean Basin).

- An evaluation of the cost effectiveness of shore line protection of coastal lowlands will be undertaken and an inventory of European coasts made to determine which segments of coasts need

protection and which segments can be sacrificed.

Rapporteur: S. Jelgersma  
Chairman: M. J. Tooley

## Working Programme of the INQUA Subcommittee on Mediterranean and Black Sea Shorelines

Following the aim of the former Executive Board of the Subcommittee, the programme for the Intercongress period will have as a guide line the improvement of the scientific relationship among the Mediterranean and Black Sea countries.

During the XII Congress of INQUA in Ottawa (1987), a working programme of the Subcommittee was defined, with some priority fields. This is not a closed Project; it can be modified and enriched with the ideas and suggestions of all those interested in shorelines.

The priority study fields are:

- Study of all Quaternary shorelines in relation to continental formations.
- Interregional stratigraphical correlation.
- Shorelines and neotectonics.
- Marine deposits of the continental shelf sea in relation to emerging shorelines.
- Continuation of the mapping of Quaternary shorelines.

On the other hand, the Commission on Shorelines has pointed out three main priority themes, respecting the different lines of the different subcommissions:

- The reconstruction of former shorelines and sea-level changes from areas and time periods deficient in sea-level data.
- The compilation of selected coastal and continental shelf palaeogeographical maps.
- The compilation of maps of selected, populous coastal lowlands showing the impact of projected sea-level change to AD400.

We all know that although the Newsletters of the Subcommittee enable us to exchange information, the maximum scientific exchange information, the maximum scientific exchange takes

place in the Field Reunions, where the problems of the different areas are directly discussed comparing them with other points of the Basin. This is why we must give more importance to these Reunions and not to consider them as the classical International Congresses or Symposia, but as something more open where we can discuss scientifically in a free and informal way.

We expect your maximum collaboration, sending proposals, articles, etc., with the aim of improving our Newsletter in relation to the shorelines subjects, which are a common concern for all of us, and which possess such a great future in the application field.

Cari Zazo  
Antonio Ulzega

### SUBCOMMISSION ON MEDITERRANEAN AND BLACK SEA SHORELINES

#### OFFICERS

*President:* C. Zazo Dpto. de Geodinámica Facultad de Geología Universidad Complutense 28040 Madrid, Spain

*Vice-Presidents:* Mediterranean Sea:

A. Oueslati  
Université de Tunis  
Fac. des Lettres et Sciences Humaines,  
Anexe  
La Manouba  
B.P. 142  
Bardo 2000 Tunis, Tunisia

Black Sea: E. N. Bylnsky  
Dpt. of Marine Geology  
C. R. Inst. Expl. of non Ferrous and Precious Metals  
Varsauskoja  
1296 Moscow 113545, USSR

*Secretary:*

A. Ulzega  
 Università di Palermo  
 Dipartimento de Geologia  
 Corso Tukory, 131  
 Palermo, Italy

*Full Members*

E. Bonifay  
 Lab. de Gèologie de Quaternarie  
 C.N.R. 1 Luminy  
 Case 907  
 13288 Marseille, Cedex 9, France

O. Conchon  
 Lab. de Pétrologie Sédimentaire det Paléon-  
 tologie  
 Université Paris Sud—Centre d'Orsay, Bâti-  
 ment 504  
 F-91405 Orsay-Cedex, France

N. El-Fishawi  
 Institute of Coastal Research  
 15 Farana St. El-Shallalat  
 Alexandria, Egypt

O. Erol  
 Istambul Universitesi  
 Deniz Bilimleri ve Cografya Enst  
 (Institute of Marine Sciences and Geography,  
 Univ. of Istambul)  
 Müsküle Sokak, Vefa  
 Istambul, Turkey

A. Horowitz  
 Institute of Archeology  
 Tel Aviv University  
 Ramat Aviv  
 Tel Aviv, Israel

A. Koutsouveli-Momikou  
 IGME  
 7A, Rue Messoghion  
 11527 Athens, Greece

A. Kranj  
 Institute for Karst Research, ZRC Sazu  
 Yu-66230 Postojna, Yugoslavia

A. Labrahimi  
 Dpt. de Géologie  
 Fac. des Sciencies  
 Université de Rabat  
 Rabat, Maroc

N. E. Saoudi  
 C.N.E.H.  
 3, Rue F. D. Roosevelt  
 Alger, Algeria

## American Fisheries Society Elects Officers

Bethesda, Maryland—Dr. Richard W. Gregory has been elected second vice-president of the American Fisheries Society (AFS) and will take office on September 14 (1988) at the Society's annual business meeting in Toronto, Ontario. He will serve as an officer of the Society for the next three years before assuming the presidency in 1991.

Dr. Gregory is acting chief of the Fish and Wildlife Service's Office of Information Transfer in Fort Collins, Colorado. He earned his B.S. and his Ph.D. from Colorado State University. From 1969 to 1984 he worked for the Fish and Wildlife Service's Cooperative Fishery Research Unit Program, first as assistant Unit leader in Maine, then as Unit leader in Montana and Florida.

Dr. Gregory has been active in the Society's

Chapters and Divisions since 1969. He was responsible for organizing the Florida Chapter and served two years as its first president. At the international level, he has chaired numerous Society committees including: the Program Committee for the 1978 AFS annual meeting, the Arrangements Committee for the 1979 meeting (co-chairman), the Publications Policy Committee, the Editorial Overview Committee, the Resolutions Committee, and the Raffle Committee. He is currently an advisor to the AFS Long Range Planning Committee and this fall will complete a three-year term as Constitutional Consultant for the Society.

When asked for his comments on the election and his upcoming presidency, Dr. Gregory said, "After I read down the list of our Society past presidents, it was clear that I shouldn't focus on

trying to top so many tough acts. Instead I'll try to develop an effective act of my own and see where I shake out when my term is over."

Also taking office in September will be the following members of the Society's Executive Committee: First Vice-President Dr. Larry A. Nielsen, President-Elect Joe G. Dillard, and President Dr. Robert G. White. Stanley A. Moberly will continue to serve on the Executive Committee for one year as immediate past president.

The American Fisheries Society, founded 118 years ago, is the world's oldest and largest orga-

nization of fisheries science professionals. The Society's 8,500 members represent the private sector, academia, and all levels of government throughout the U.S., Canada, and 70 other countries.

Contact: Carl R. Sullivan, Executive Director  
American Fisheries Society  
5410 Grosvenor Lane, Suite 110  
Bethesda, MD 20814-2199  
301/897-8616

## Vic Klemas Joins International Space Year Planning Committee

Dr. Vic Klemas, Director of the Applied Ocean Science Program at the University of Delaware, has been appointed by the National Academy of Sciences to its International Space year (I.S.Y.) Planning Committee. This Com-

mittee will help plan the U.S. scientific contribution to the I.S.Y. which will be conducted in 1992. Professor Klemas has also been a member of the National Research Council's Space Application Board since 1986.

## International Environmental Congress

### "THE HARBOUR—AN ECOLOGICAL CHALLENGE"

The Hamburg harbour will celebrate its 800th birthday in 1989, and on the occasion of this jubilee the Ministry of the Environment in Hamburg is organising an international environmental congress under the slogan.

"The Harbour—An Ecological Challenge."

The congress will take place in the Congress Centrum Hamburg in the week from the 11th until the 15th of September 1989, with plenary sessions running parallel to specialist conferences.

The following subjects have been planned for inclusion:

(1) *Harbour and Ecology*

(showing the development of harbours and rivers as waterways and the ecological results, the description and evaluation of the ecological consequences of harbour expansion, levels of water pollution, and the special problems faced by harbour cities.)

(2) *Attempts to Find Solutions to the Environmental Problems by Means of Planning*

(showing the environmental demands being placed on old harbour areas by the present-day conditions, concepts and measures undertaken to reduce emissions, the ecological effects of harbour and waterway planning.)

(3) *Technical Environmental Protection Measures in Harbours and their Waterways*

(with reference to the disposal of oil and chemical residues, the clearing of contaminated sites, and the handling and disposal of dredged sludge with a high pollutant burden.)

Scientists and specialists in the field of harbour planning and organisation are to present for discussion and evaluation papers relating to the finding of solutions to harbour related ecological problems.

For further information interested parties should contact:

## Association of Island Marine Laboratories of the Caribbean

The Association was founded in 1957. It consists of 25 Marine Laboratories in the greater Caribbean area which are Institutional Members, and more than 500 Individual Members working in the Caribbean or who have interest in Caribbean marine science. A proceedings volume is published for each meeting. Two newsletter issues are published each year. Individual membership is \$US5.00 per year. Dues may be sent to Dr. Lucy Bunkley-Williams, Department of Marine Sciences, University of Puerto Rico, Mayaguez, Puerto Rico 00708.

International Member Laboratories include: Bellairs Research Institute, Barbados; Bermuda Biological Station, Bermuda; Bitter End Field Station, British Virgin Islands; Carai-bisch Marien-Biologisch Institut, Netherlands Antilles; Caribbean Marine Research Centre, Bahamas; Center for Energy and Environmental Research, Puerto Rico; Centro de Investigaciones de Biologia Marina, Dominican

Republic; Centro de Investigacion y de Estudios Avanzados, Mexico; Centre Universitaire Antilles, Guadeloupe; College Center for the Finger Lakes, Bahamian Field Station, Bahamas; Department of Marine Sciences, Puerto Rico; Discovery Bay Marine Laboratory, Jamaica; Estacion de Investigaciones Marinas de Margarita Fundacion La Salle, Venezuela; Fisheries Research Laboratory, Puerto Rica; Fundacion Cientifica Los Roques, Venezuela; Institute of Marine Affairs, Trinidad and Tobago; Instituto de Investigaciones Marinas de Punta de Belin, Colombia; Instituto Oceanografico, Venezuela; Marine Science Centre, Virgin Islands; Mote Marine Laboratory, Florida; Port Royal Marine Laboratory, Jamaica; Rosenstiel School of Marine & Atmospheric Sciences, Florida; Smithsonian Tropical Research Institute, Panama; West Indies Laboratory, Virgin Islands.



### Book Reviews

**Quantification of Beach Profile Change**, by Magnus Larson, 1988. Printed by Grahn, Lund, Sweden. \$US10.00. No ISBN.

The subject dealt with by the author has a great deal of interest, scientifically, technically and practically. The ultimate objective of the study was to develop an engineering numerical model of beach profile change which has the capability of simulating formation and movement of major morphologic features of the profile, such as bars and berms. Beach profile response produced by severe storm or hurricane events, with large erosion and possible dune

retreat, was the principal target, although profile change occurring on longer time-scales, such as adjustment of beach fill, which involves accretionary processes as well as erosional, was also of interest. A basic assumption underlying this work is that major morphologic change occurring in and around the surf zone is produced by breaking and broken waves.

As a basis for model development, data sets from two large wave tank (LWT) experiments were used to understand the fundamental processes governing beach profile change and to establish cause and effect relationships between waves, water level, and properties, and